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(FILE 'HOME' ENTERED AT 11:38:55 ON 14 AUG 2002)

FILE 'CA' ENTERED AT 11:39:11 ON 14 AUG 2002

E COMIZZOLI R/AU

L1 66 S E4-6

L2 1 S L1 AND 1991/PY

E LEWERENZ H/AU

L3 239 S E4-10

L4 8 S L3 AND ELECTROCHIM?/SO

L5 1 S L4 AND 1992/PY

L6 31 S TRIPLE TRACK

L7 9572 S (SI OR SILICON OR POLYSI OR POLYSILICON) (2A) (WIRE OR CONDUCTOR OR ELECTRODE)

L8 61 S L7 AND (MEMS OR MICROELECTRON? OR INTEGRATED OR IC OR CIRCUIT) (6A)
(FAILURE OR RELIAB? OR PROTECT?)

L9 94 S L2, L5-6, L8

L10 90 S L9 NOT PY>2000

=> d l14 bib, ab 1-90

L14 ANSWER 21 OF 90 CA COPYRIGHT 2002 ACS

AN 125:156455 CA

TI **Protective circuit** for semiconductor **integrated circuit**

IN Motai, Hiroshi

PA Shinnippon Seitetsu Kk, Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

PI JP 08172166 A2 19960702 JP 1994-333908 19941216

AB The **protective circuit** consists of an input electrode, an output **electrode**, an amorphous **Si** well, and a Schottky barrier protective diode. The **protective circuit** may have an amorphous **Si protective** resistor.

L14 ANSWER 27 OF 90 CA COPYRIGHT 2002 ACS

AN 123:271647 CA

TI Surface conductance measurements of adsorbed gases

AU Barger, C. B.; Phillips, T. E.; Benson, R. C.

CS Applied Physics Laboratory, Johns Hopkins University, Laurel, MD, 20723, USA

SO Proceedings - Electronic Components & Technology Conference (1994), 44th, 728-32

AB The surface conductance of adsorbed water, carbon dioxide, and ammonia has been measured as a function of temp. using a **triple-track** test substrate. The individual pure gases were studied along with their mixts. Adsorbed carbon dioxide or ammonia was found to have a negligible surface conductance, while adsorbed water exhibited an increase in conductance beginning at -25°C. Mixts. of carbon dioxide and water exhibited essentially the same conductance as water by itself, while mixts. of ammonia and water exhibited a conductance 104 times larger than water between -40°C and 0°C. Mixts. of all three gases resulted in a relatively low conductance at lower temps. (-100°C to -50°C). Corresponding pressure measurements indicated that vaporization was greatly suppressed in some cases, suggesting strong interaction between the adsorbed species.

L14 ANSWER 30 OF 90 CA COPYRIGHT 2002 ACS

AN 121:242763 CA

TI Integration of materials and processes for reliable silicon interconnections

AU Paraszczak, J.

CS IBM Semiconductor Research and Development Center, Yorktown Heights, NY,
10598, USA

SO J. Vac. Sci. Technol., B (1994), 12(4), 2835-8

AB As device densities in integrated circuits have grown, the no. of
connections between them has followed, resulting in larger chips with
increased nos. of layers of metal wiring. Traditionally, these layers of
wiring have been fabricated using aluminum and its alloys for the **conductor**
and **silicon** oxide as the dielec. and insulator. New combinations of
dielecs. and metals promise improved performance and increased reliability,
which can require alternative methods of fabrication.

L14 ANSWER 40 OF 90 CA COPYRIGHT 2002 ACS

AN 116:245772 CA

TI Surface conductance on insulators in the presence of water vapor

AU **Comizzoli, R. B.**

CS AT and T Bell Lab., Murray Hill, NJ, USA

SO Mater. Dev. Microelectron. Packag.: Perform. Reliab., Proc. Electron.
Mater. Process. Congr., 4th (1991), 311-16. Editor(s): Singh, Prabjit.
Publisher: ASM Int., Materials Park, Ohio.

AB The surface conductance of an insulator in the presence of water vapor is
directly related to several failure mechanisms affecting electronic
components and assemblies. These mechanisms include errors resulting from
leakage current, corrosion, elec. arcing, and surface ion effects. Various
investigators have presented data on the surface conductance of insulators.
In general, the surface conductance depends exponentially on relative
humidity. In this report a phenomenol. model that fits the empirical
dependence of surface conductance on relative humidity and temp. is
described.

L14 ANSWER 41 OF 90 CA COPYRIGHT 2002 ACS

AN 116:203246 CA

TI Anodic oxides on silicon

AU **Lewerenz, H. J.**

CS Bereich Photochem. Energieumwandlung, Hahn-Meitner-Inst. Berlin, Berlin,
1000/39, Germany

SO **Electrochim. Acta** (1992), 37(5), 847-64

AB The formation of anodic oxides on n- and p-type silicon was investigated by
chronoamperometry, in situ ellipsometry, in situ excess microwave
reflectivity measurements, ex situ x-ray and UPS (XPS and UPS) and LEED.
Comparison with data on thermally oxidized samples reveals that anodic
oxides are less dense being characterized by a compn. profile. In addn.
differences in the etching rate and compn. profile of anodic oxides on n-Si
and p-Si are obsd. The microwave measurements allow a correlation between
oxide formation in NH₄F soln. and changes in charge transfer velocity and
surface recombination velocity. At high anodic potentials, photocurrent
oscillations on oxidized samples occur at oxide coverages of about 35-40 Å
as evidenced by XPS. The surface conditions during dark current flow are
investigated by XPS, UPS and LEED. The dark current is assocd. with
distinct surface changes resulting in an electrolytically hydrogenated
surface if samples are emersed after dark current decay. Photocurrent
multiplication processes are briefly described, studied by intensity
modulated photocurrent spectroscopy (IMPS).

L14 ANSWER 47 OF 90 CA COPYRIGHT 2002 ACS

AN 114:33671 CA

TI The effect of volume resistivity on polymer electrical leakage current
measurements

AU Troyk, Philip R.; Anderson, James E.

CS Illinois Inst. Technol., Chicago, IL, 60616, USA
SO Int. SAMPE Electron. Conf. (1989), 3(Electron. Mater. Processes), 969-82
AB The authors investigate the theor. prediction of elec. leakage currents for temp.-humidity-bias (THB) tests. An electrostatic finite element model was developed for **triple-track** and comb patterns. Using known values for vol. resistivity combined with a specific test pattern geometry, a prediction of leakage currents can be made. The model can be used to compute the leakage current for samples in which polymer-substrate interfacial currents are negligible thus predicting leakage currents for samples which would be expected to pass THB testing.

L14 ANSWER 53 OF 90 CA COPYRIGHT 2002 ACS

AN 111:88284 CA

TI Humidity-temperature-voltage acceleration model for corrosion of thin film aluminum

AU Osenbach, J. W.; Zell, J. L.

CS AT and T Bell Lab., Reading, PA, 19612-3566, USA

SO Proc. - Electrochem. Soc. (1989), 89-6(Proc. Symp. Reliab. Semicond. Devices Interconnect. Multilevel Met., Interconnect, Contact Technol., 1988), 53-80

AB The corrosion behavior of thin film Al metalization was studied as a function of temp., humidity, and bias (THB). The studies were done on (room-temp.-vulcanized silicone rubber)-coated unpassivated Al **triple-track** test structures. Studies were done at 85-150°, relative humidities between 50 and 85%, and elec. fields between 5×10^3 and 2×10^5 V/cm. Based on the results, the authors developed two acceleration models. The first model describes those failures that are caused by contaminants such as Na⁺, K⁺, and Cl⁻. This model can be used to predict the THB behavior of devices that are contaminated prior to encapsulation or are encapsulated in contaminated polymers such as epoxies. The second model describes those failure that occur due to wearout of the polymer-device interface. This model can be used to predict the THB behavior of devices that are "clean" and encapsulated in clean well-bonded polymers such as RTV.

L14 ANSWER 70 OF 90 CA COPYRIGHT 2002 ACS

AN 99:150388 CA

TI Evaluation of an encapsulant material for thick-film resistor networks applied to a thin film HIC

AU Iannuzzi, Melanie

CS Bell Lab., Inc., Allentown, PA, 18103, USA

SO Proc. - Electron. Compon. Conf. (1983), 33rd, 591-601

AB Modified Dow Corning 648 resin was evaluated for use as a peroxide-resistant, thermally stable, screenable encapsulant for hybrid integrated circuits (HIC). Temp.-humidity-bias (THB) testing of the encapsulant was carried out on **triple-track** test vehicles of several metalizations (thin-film TiPdAu conductors and Ta-N resistors, and thick-film PdAg, PtPdAg, PtAu and Au). The modified DC648 resin gave superlative THB performance, independent of exposure to peroxide or further encapsulation with silicone rubber. Temp. cycling resulted in surface crazing, which did not affect metalization reliability. The effect of the material and its cure cycle on serpentine trimmed thick-film resistors was negligible if a glaze was used under the encapsulant. Thermal aging and thermal cycling of the resistors resulted in acceptable behavior if the glaze was used. THB testing of a model of an applied structure resulted in outstanding performance of the encapsulant material on the thick-film resistor network. No adverse effects of the material were found on the thin-film components. Both of these results are independent of the use of peroxide on the samples.

L14 ANSWER 81 OF 90 CA COPYRIGHT 2002 ACS

AN 90:96426 CA

TI New acceleration factors for temperature, humidity, bias testing

AU Sbar, N. L.; Kozakiewicz, R. P.

CS Bell Teleph. Lab., Inc., Allentown, Pa., USA

SO Annu. Proc., Reliab. Phys. [Symp.] (1978), 16, 161-78

AB Device acceleration factors were estd. from data on the effect of temp., relative humidity, and bias potential on the surface conduction, using metalization test vehicles including **triple track** conductors on 99.5% alumina substrates and beam leaded Si chips fabricated with fine line conductor patterns. Anal. expressions for the acceleration factors were derived for both encapsulated and unencapsulated test specimens. Lower acceleration factors are predicted for specimens encapsulated with RTV silicone rubber than for unencapsulated specimens.

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